

CARBON-BEARING GRAINS AND FLUIDS SOLIDIFIED ON THE MOONS OF MARS. Y. Miura¹ and T.Tanosaki², ¹Yamaguchi University (Yamaguchi, Yamaguchi, 753-0074, Japan, yasmiura50@gmail.com), ²Kogakuin University (Hachioji, Tokyo, Japan).

Introduction: Asteroids and Moons (of Earth and Mars) are studied mainly from material sciences of mineral and texture with formation ages by using database of Earth's rocks and collected meteorites of Asteroids and Earth's Moon, where the collected meteorites show quenched texture and limited mineral-solids without remained fluids [1-5]. The purposes of the paper is mainly to elucidate formation processes of carbon-bearing solids from fluids of the Phobos and Deimos compared with Asteroids and Mars globally.

Solidified fluids on meteorites: Remained fluid-water cannot be obtained at meteorites and Moon (Earth or Mars) rocks, because global water (on Earth) with formation of many mineral series and rock kinds cannot be confirmed [2-4]. Fluid formation of these meteorites are rapidly solidified to be formed ground-mass among chondrules and/or phenocryst of crystalline minerals. This texture indicates that fluids are formed quickly and changed to non-crystalline aggregates to fix solids of chondrules or crystalline grains from meteorite texture.

Solidified fluids on meteorites and Mars: The heating experiment of carbonaceous meteorite produces in authors experiment only water after heating reaction, though there are no water before heating. This indicates that remained fluids cannot be longer obtained at meteorites and the Mars rocks, because fluids are rapidly evaporated and/or solidified to rocky textures of solidified aggregates, which can be proved after melting of meteorites to be produced water fluids shortly [3-6].

Solidified grains produced by laser melting: Authors have produced quick fluids texture during laser sputtering experiments of carbon-bearing rocky grains in this study [3, 4]. This indicates formation of fluid liquid phase from solid mineral to quenched grains, though there are no previous fluid water in the sample before laser sputtering process (Fig.1). The present experimental results in Fig. 1 indicate that there are any elements, ion and elements of fluids (water and carbon dioxides) are existed separately and combined by extreme conditions of high temperature and pressure, which can explain the poor mineral and rock kinds compared with water-Earth showing circulated fluids and water supply by longer interior activity.

Carbon-bearing materials formed at collisions: Almost all evaporated elements are disappeared without any remained solidified materials (except carbon-bearing grains) after impacted collision on Asteroid

and the Moons' surface. In fact, it can be observed solidified carbon-bearing nano-grains on the Moon rocks (collected on Africa and Antarctica) and chondritic meteorites (ordinary to carbonaceous samples), which indicates that they will form on the surfaces [3, 5].

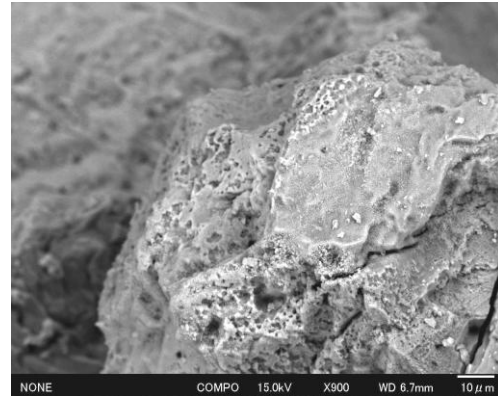


Fig.1. Electron micrograph of fluids-solidified carbon-bearing grains by laser melting experiment on carbonate rocks [3-5].

Expected space exploration for Martian Moons:

Among many Asteroids, volatile (carbon)-bearing materials are produced for active multiple collision (including impact crater sites) or largely broken process by huge collisions, where many related material resources with volatiles (carbon & hydrogen) are expected to be the next space resources on the Moons.

Summary: Natural resources of volatile (carbon)-bearing materials on the two Moons (Mars) of Phobos and Deimos are expected for next target for sample collection and material circulation sites for limited living bases in future, which are proved to be obtained by meteorite analyses and artificial laser experiments.

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